**Things before the meeting – 10/14/2021**

1. You need to review the ownership literature related to the tri.
2. Understand whether the rsei score is by are or facility.

Other papers on ownership and tri

**There is Cong and Freedman 2011 which is about corporate governance, disclosure and environmental performance measured according to the tri.** Their result is that there is no relationship between good corporate governance and good environmental performance. Recent corporate scandals led to the passage of Serbanes Oxley which is about financial aspects of corporate governance. The problem with traditional studies of the relationship between corporate governance and pollution is that they focus on measure of corporate governance which are very specific to pollution and as a consequence cannot be considered as representative of what we define as good corporate governance. As a result, they want to use an overall index of corporate governance. **Their main result is that corporate governance is unrelated to pollution; nevertheless, it is positively associated with environmental disclosure; so corporate governance contributes to telling the story not to improving it.** In order to measure environmental performance, they resort to the tri. The main limitations of the tri is that it is related to plants, not all pollutants are available, but only the ones that the us epa considers as toxic. While most of the literature uses the pounds measure, they resort to the rsei model. The rsei model gives you three possible measures of pollution: pounds, toxicity-weighted pounds, rsei scores (in which in addition to the toxicity weights you also consider population density and exposure which allows to assess potential). The rsei score is assigned to each emissions; then you can aggregate at the plant level and also at the firm level. See page 3 for various references to the literature relevant to the topic. They don’t use discrete measure of corporate governance, but they go for an aggregate index called gov score, which is regarded as very broad. It is based on 51 corporate governance provisions. It has been already used in the literature in order to investigate the relationship between corporate governance and financial performance. Better corporate governance should be associated with beteer environmental performance, because a bad environmental performance is a long term risk, which should be addressed by the governance of a company. In addition, better corporate governance should be associated with more environmental disclosure, because if a firm improves its environmental performance it should have incentives to let the public know about it. Their sample period is 2003-2005, when the corporate governance of firms significantly improved as a result of the passage of the sox law. They measure environmental performance by considering the rsei model; they use three measures: pounds, toxicity weighted pounds, rsei scores. They account for the size of firms and they deflate the measure of environmental performance by sales. In order to measure the extensiveness of disclosure, they also compute a disclosure score, which is based on the comparison between the information disclosed in environmental and csr reports and the information which is present in the tri. They just work in an ols framework. As regards the previous studies on how corporate governance should relate to environmental performance, the main results are the following:

1. Independent members of the board of directors should improve environmental performance, because they are more aligned with the interests of the stakeholders at large.
2. Boards with fewer members violate environmental less often (this could be related to the personal responsibility argument); the argument that is used is that larger boards are easily prone to opportunistic behavior by the ceo.
3. There is a positive relationship between environmental lawsuits and the number of peers in the board of directors.
4. When there is a larger share of ownership in the board of directors, then environmental performance improves. But there are also studies which prove the opposite; probably because if the directors own stocks then they have an incentive to boost the firm’s financial performance.

**Kanashiro 2020 is about the environmental governance mechanisms which lower toxic emissions.** They find that compensation is an effective mechanism to lead managers to invest in long-term uncertain environmental projects. Also the presence of an environmental committee is positively associated with environmental performance. This study is about what is defined as “greening corporate governance”, in the sense it is not about traditional corporate governance indicators, but about features which are specifically added to the corporate governance of a company so as to boost the firm’s environmental performance. If you link the compensation of managers to financial performance, you could create a wrong incentive scheme with reference to envioronmental performance. Instead, what you need to is to make sure that for the managers it is convenient to boost the firm’s environmental performance. So the compensation scheme is related to incentives, whereas the presence of an environmental board is related to monitoring; these are the two main aspects of corporate governance. The literature is pretty divided, in the sense that for some scholars these two elements are substitutes, whereas for others they are complements. In the opinion of the author, the two elements are complements. They focus on the period of time between 2006 and 2011 and their sample consists of sp500 firms which are also subjected to the tri reporting requirement. Their dependent variable is the toxicity weighted sum of emissions that you have computed. They aggregate the sum of emissions at the plant level and then add emissions up at the firm level, so it is the same procedure that you have applied on your own. For easy of interpretation, they multiply emissions by minus one. The existence of an environmental compensation scheme is associated with a dummy variable, and the same is true for the environmental committee. They look at firms’ annual reports and proxy statements in order to find this information. They control for different accounting variables and they run a specification with random effects (panel regression). In order to correct for endogeinity they use propensity score matching (the probit model is run referring to a dummy variable which takes value one when the firm has an environmental committee). Their conclusion is that the combination of board and compensation is associated with a reduction in emissions. So there is support for the complement theory.

RSEI scores

In general, an rsei score is computed by considering the amount of emissions, a toxicity weight and the population exposed. Rsei scores are only comparable to other rsei scores; they are used in order to rank the level of risk associated with different emissions. Actually they are not designed to quantify risk, but to identify sources of concern.

What you computed before is called rsei hazard (toxicity weighted emissions which do not account for spatial characteristics which may be hard to get). In some cases, rsei hazard does not translate into real danger.

Easy rsei data (which can also be facility based) are available for the entire period and is facility based. You can get both the rsei hazard and the rsei scores.

That’s a link on how it should be used: <https://www.epa.gov/rsei/how-rsei-should-be-used>. The rsei is mostly used in order to identify facilities which generate the highest level of risk. The rsei score are designed to represent the worst case scenario (that’s why when there is a group of chemicals you pick up the toxicity weight of the most toxic substance).

This is the dashboard of the last version of the rsei model. You need to have 4 gb of hard space

Enforcement data

Enforcement data prior to 1996 are quite unreliable.

Data are either administrative or judicial; you should distinguish between them. There are also data on informal enforcement but cannot be joined with the other data.

Apparently, the settlement specific data are in case\_enforcement\_conclusions.csv. it makes no differences; what you have done is correct.

Shive and forster use the epa database to find data on actions (judicial and administrative) and the total penalty. They assign the action to the year when the action started.

While the tri is available from 1987, the datasets which contain information on greenhouse gas emissions and on so2 and nox are available from 2008. The data from the tri have no firm identifier other than the firm name and must be manually matched with compustat. The papers about female ceos uses the number of penalties and five measures of penalty amount. These variables are considered as proxies of a firm’s environmental performance. They consider the total sum of the chemicals emitted, which is crazy.

My understanding is that the papers you found do not use data on single settlements, but use the first dataset that you have. The data is established as fiscal year (when the activity was carried out) and they use total penalty assessed so as to estimate the penalty.

Miscellaneous

The maximum penalty for tri was paid by Unisea, a company producing sea food, who hid an enormous release of ammonia to water.